Amendment of the Claims:

Please amend the claims as follows:

1. (Currently Amended) In an underground containment barrier excavating and emplacement apparatus having means for excavating earthen material from about a buried waste site, and conveyor means for carrying the excavated material outwardly of the apparatus, the improvement comprising a sensor system for sensing physical properties of the excavated material including:

sensing means disposed adjacent the conveyor means for sensing selected physical properties of the material carried by the conveyor means, and for producing signals identifying the sensed physical properties, and

signal processor means for processing said signals and for producing human perceivable representations of the physical properties identified by the signals, and wherein the conveyor means is positioned substantially below the surface of the earth generally adjacent the underground containment barrier.

2. (Original) A sensor system as in claim 1 wherein said sensing means comprises a gamma ray spectrometer disposed above the conveyor means for detecting radiation emanating from the material on the conveyor means.

3. (Original) A sensor system as in claim 1 wherein said sensing means comprises an X-ray fluorescence detector disposed above the conveyor means for detecting the presence of RCRA metals in the material on the conveyor means.

4. (Original) A sensor system as in claim 1 wherein said sensing means comprises scintillating fiber bundle means disposed below/above the conveyor means for detecting radiation emanating from the material on the conveyor means.

5. (Original) A sensor system as in claim 1 wherein said sensing means comprises an acousto-optic tunable filter disposed above the conveyor means for detecting volatile organic compounds present in the material on the conveyor means.

6. (Original) A sensor system as in claim 1 wherein said sensing means comprises a Fourier-transform infrared spectrometer disposed above the conveyor means for detecting volatile organic compounds present in the material on the conveyor means.

7. (Canceled)

8. (Currently Amended) An underground containment barrier excavating and emplacement apparatus for excavating earthen material from about a buried waste site, comprising:

a conveyor for carrying excavated material outwardly of the apparatus, the conveyor being positioned substantially below the surface of the earth generally adjacent the underground containment barrier; and

a sensor system for sensing physical properties of the excavated material, wherein the sensor system comprises:

at least one sensor disposed adjacent the conveyor and configured for producing at least one signal representing at least one sensed physical property of the excavated material carried by the conveyor, and

a signal processor configured for processing the at least one signal and producing human perceivable representations of the at least one sensed physical property represented by the at least one signal.

9. (Previously Presented) The apparatus of claim 8, wherein the at least one sensor comprises a gamma ray spectrometer configured for detecting radiation emanating from the excavated material on the conveyor.

10. (Previously Presented) The apparatus of claim 8, wherein the at least one sensor comprises an X-ray fluorescence detector configured for detecting at least one RCRA metal present in the excavated material on the conveyor.

11. (Previously Presented) The apparatus of claim 8, wherein the at least one sensor comprises a scintillating fiber bundle configured for detecting radiation emanating from the excavated material on the conveyor.

12. (Previously Presented) The apparatus of claim 8, wherein the at least one sensor comprises an acousto-optic tunable filter configured for detecting at least one volatile organic compound present in the excavated material on the conveyor.

13. (Previously Presented) The apparatus of claim 8, wherein the at least one sensor comprises a Fourier-transform infrared spectrometer configured for detecting at least one volatile organic compound present in the excavated material on the conveyor.

14. (Previously Presented) The apparatus of claim 8, wherein the at least one sensor comprises a plurality of sensors.

15. (Previously Presented) The apparatus of claim 14, wherein the plurality of sensors comprise at least two sensors from the group consisting of a gamma ray spectrometer, an X-ray fluorescence detector, a scintillating fiber bundle, an acousto-optic tunable filter, and a Fourier-transform infrared spectrometer.